1: Petrullo E-3 (1933-34) 1939 SS19 Yaruro SS19

123 342 We camped on a large wind-swept beach on the Capanaparo and waited there for Landaeta. While waiting I made visits about the country, seeking out Yaruros wherever I could find them. In one nearby group I noticed that unlike most of the Yaruros, these had built permanent shelters, constructed similarly to the houses of the ranchers. However, there was one significant difference. With true Indian logic, they had left the walls open at the bottom, so that the wind could sweep through the house and keep it cool and free from insects.

791 One morning we embarked to visit a group led by Pablo Reyes, being on an island in the Orinoco, at the mouth of the Capanaparo. Pablo Reyes had been described to us as a very old and very wise man. Borrowing a small dugout, we set out to visit him, traveling mostly by night. On our way we saw and heard a great deal of [311] animal and bird life, for the lower part of the river was less hunted by the Yaruros than the upper part. On the banks we saw numerous tracks of the cats, we saw many capibaros or "chiguires" and we were often serenaded by the roar of the howlers.

133 Our entrance into the Orinoco was dramatic. We were catapulted out of the swift waters of the mouth of the Capanaparo and staggered about among the powerful cross currents and eddies at the confluence of the two rivers. The east wind made travel no easier, as it was blowing a gale. On the far side of the Orinoco were the hills of Guiana, rough and jagged, with gnarled vegetation, and dark patches of jungle growth. There were several islands of odd shape, and one of them, about halfway across the Orinoco, was the Linda Bara, to which we made our way.

177 Encamped on this island we found Pablo Reyes' band and a number of "Racionales," that is, "civilized," Venezuelans of the llanos, who during the dry season take to living like the Indians, except that they clutter their shelters with civilized equipment. The result is that their houses are infested with parasites of all kinds. However, they too live upon crocodiles, turtles, and the eggs of the latter.

311 237 This portion of the Orinoco is, in late March and early April, the gathering ground of both Indians and Racionales. The region teems with turtles. By common agreement, stretches of the beaches where the turtles are known to gather in large numbers are not hunted until April, at which time the people dig up thousands and thousands of newly laid eggs out of which they make an oil for export. The [436] center for this commerce is the little settlement of La Urbana, originally a Capuchin mission established about 1750.

791 Like Landaeta, Pablo Reyes had also learned of my coming, and was ready for me. He too is a shaman, and delights in speaking to a sympathetic listener about religious themes, of his conception of

1: Petrullo E-3 (1933-34) 1939 SS19 Yaruro SS19

In the case of the Yaruros all of these factors have played an important role and are currently active in reducing their territories and food supply to a degree that will mean imminent extermination of the people. It is true that since the first settler arrived in their country the Yaruros could have made readjustments in their culture which perhaps might have permitted them to survive. They could have learned, for instance, to raise horses, cattle, and to cultivate the soil as the Guajiros, living in a country similar to the llanos, have done. But they have chosen to remain firm in their own culture, own traditions, and own universe, and as a result are expecting to pay the penalty. Why they have failed to make the readjustment which would have brought them into a livable relationship with the newcomers and have persisted in keeping to their primitive, nomadic existence may be answered in the pages that follow.

Dependency on hunting, fishing, and gathering of edible fruits and roots imposes nomadism upon a people and prevents living together in large groups. The degree to which a people have to wander, the extent of the territory over which they must roam, and the size of the group, is dependent upon the abundance of the food supply in the region. The Yaruro hunting groups are small and they stay in one camp not more than a few days; so, they are to be met plying up and down the river in their canoes or traveling over land to the water holes, ever hunting for food.

HUNTING TERRITORIES

Each hunting group has a territory over which it is free to roam. Over this region only its members are allowed to hunt and gather fruits and roots, but the rivers, the main streams, are open to all. The accompanying map shows the limits of the present hunting territory of the Yaruros of the Capanaparo. It would seem that anciently, when the Yaruros were more numerous, they roamed over a vaster region cut up into small portions over which hunting rights were distributed among various hunting family groups. I was assured that the Yaruros of the Sinaruco also have divided their country into family units.

There is also a sort of division among the Yaruros which transcends family grouping. The Yaruros of the Capanaparo, for instance, consider themselves a unit, though loosely bound, as distinct from the Yaruros of the Sinaruco, so that they consider the land drained by the Capanaparo as theirs and the region drained by the Sinaruco as the land of the Yaruros of that river. And yet, above all this, there seems to be a tribal feeling as opposed to the tribal divisions. The real significance of this is that among the Yaruros there is permitted a degree of mutuality in the use of the hunting rights

241 With respect to these habitat conditions, the single most important, and, in the case of the Yaruro, predominant subsistence activity is swidden-ing, also called brand tillage, slash and burn horticulture, milpa, or shifting horticulture, a type of subsistence which peoples in both tropical and temperate forested areas of the world have practiced and still practice widely. The procedure followed by the Yaruro is very much like that of other swiddeners.[3] A garden site is chosen in virgin forest or preferably in second growth. During the dry season, the underbrush is first cut out and then the larger trees are felled by a variety of techniques including the use of machetes, axes, or girdling. The cut trees and brush are left to dry during the remainder of the dry season. Just as the first rains are approach-ing, these logs, along with whatever smaller underbrush may be standing, are set afire. The smaller materials largely burn up while the charred remnants of large trees lie scattered about. Burning partially destroys the [134] humus, as does removal of the forest cover, and to a degree disturbs the soil structure,[4] consequently often speeding the decline of soil fertility despite the addition of organic material from the rotting of partially burned tree boles. Also ash from the burned wood contributes some fertilizing minerals to the soil, thus increasing the short-term fertility of the soil before it is exhausted by man, plants, and rain.

134 The destruction of the forest cover and of the humus layers exposes
241 the plots to more drastic leaching or erosion by tropical rains. This fact, together with a decrease in fertility from continual replanting and harvesting in unweeded and uncultivated soils, accompanied by a gradual but drastic invasion by weeds and grasses, makes further use of the plot uneconomical at best and impossible at worst. It is abandoned in favor of some entirely new plot or one which has been reconstituted by long fallowing. Abandoned plots overgrown by weeds and grasses, though they may soon recover their fertility, are so difficult to work with the characteristic swidden horticul-tural tools,[5] the digging stick and the machete, that they generally cannot be recultivated until a new forest cover has grown up and shaded out smaller vegetation. This usually takes a number of years, in general a minimum of 10 to 15 years, though, in other parts of the world this range may be extended in both directions.[6]

241 Planting is carried out beginning just before or just at the inception of the rains and just after the burning. It may be continued at intervals during the rainy season in order to stagger the harvests. Plantings may be staggered through part or all of the dry season, if climate and horticultural conditions permit, to create a more or less continuous crop, and the probability of a correspondingly higher annual productivity per capita and per land area. Where marked differences between seasons are not found, the entire process may be more or less continuous throughout the year. Irrigation, terracing, and fertilization (other than natural fertilization resulting from silting) are not used.

●311 The remaining land surface presents resource areas of various types. In passing, it should be noted, though it is too often thought to be self-evident and consequently not specified, that what constitutes a resource

3,4,5,6 [for footnote see category 116, p. 42--Analyst]

area is only such in reference to the presence of a given technology. The presence of such a technology is not guaranteed in any particular culture by any historical, evolutionary, geographical, or ecological necessity. Its presence may entail a particular historical explanation or a general evolutionary one. In any case, its absence entails the absence of the use of certain resources whose presence we can observe only in retrospect. 311

Other resource areas besides those utilized because of the presence of horticulture among the Yaruro become available by their possession of hunting, gathering, and fishing technologies, as well as recently acquired animal husbandry in the form of pig-herding. Hunter animals include deer, armadillo, capybara, paca, peccary (?), iguana, and a number of birds (see Table II, p. 4)[1]. These are variously distributed spatially according to the specific ecological niches for which they are adapted. Thus deer are apparently usually found dispersed in the somewhat damper, low-lying savanas where grass is greener and water more available away from the scene of human activity. Armadillo are found distributed throughout the savana. Other species, however, such as the capybara, live near the edge of permanent waters, mainly the rivers. Alligators also live only in the rivers. The faunal carrying capacity of the savanas appears to be quite low in the Cinaruco llanos since foraging foods for larger game animals are sparse. It is important to note that not only is the overall carrying capacity governed by the minimum average food supply of the savanas in the florally more restricted dry season,[7] but the distribution of animals varies considerably from the wet to the dry season. In the latter, animals tend to cluster nearer the rivers or the widely dispersed water holes. Consequently, the locus of hunting must also shift seasonally (see Maps)[2]. Savana hunting techniques are neccessarily different from those used in procuring food in the rivers, whether hunting alligators or capybara, or, of course, fishing. There is some seasonal variation in the locus of fishing, too, although this is much less marked on the Cinaruco than on the freely-flooding streams of the flatter, more north-easterly savanas of the Apure llanos. In the rainy season, fish move up the larger streams into somewhat shallower waters where more plant and insect food is available to them. However, they are apparently unable to move up smaller streams which often have rapids-like stretches interrupting their course. Thus fishing in the rainy seasons is directed towards the larger creeks and away from the smaller creeks and the river itself, where the water has become too deep for successful fishing since the fish are scarcer and more difficult to see in the deep, swift currents of winter. In respect to animal husbandry, recently introduced pigs are pastured anywhere in the savanas but preferably next to the village or quite a distance from it, in either case far from the nearest gardens (Sp. *conuco*, Y. *tadó*), an effort which is rarely successful, since the pigs, in their wisdom, are among the main predators on the garden crops. Gathering may be carried out in the dry or the wet savana depending upon the plant food to be gathered, or it may be carried out near the creeks especially for the fruit of the moriche palm. The rivers do not appear to be used in gathering.

224 137 [221] 226 133 231 [241] 222

[1] [See pp. 35-37, category 116 --Analyst]
[2] [see pp. 40-41, category 102 --Analyst]
[7] [for footnote, see p. 42, category 116 --Analyst]

311 In short, the habitat conditions are as follows, given that the Cinaruco
22 Yaruro have a technology including hunting, gathering, fishing, and animal husbandry, and horticulture. All resources are found within a narrow band of about 4-5 miles between the Cinaruco river and the high sand dunes occurring in the interfluve to the north, in which only an occasional deer is found. Within this space there are three major resource areas distinguishable: 1) the open savanas for hunting and gathering, the former involving much greater dispersion of resources than the latter and consequently quite different techno-social conditions. Both activities change location markedly with the seasons. 2) The rivers and *caños* are used for water-animal hunting and for fishing. Fishing also displays a seasonal shift between river and *caño*, whereas river hunting for alligator and turtle becomes totally impracticable in the wet season. 3) The wooded areas, themselves dispersed, include the gallery forests of smaller streams where flooding is limited but water
[241] and soil abundant and the *montes* occurring here and there in mid-savana. These areas provide the Yaruro with garden sites. Away from the streams, there are also occasional tiny patches of suitable soil not close enough to the water table for dry season use, but which get enough rain to be used for planting of seasonal crops in the wet season. Schematically, the situation is shown on Table II_A^1, a list of foods entering into Yaruro economy and their relative seasonal occurrences, and on Maps I and II_A^2 of the seasonal locations of these resources.

182 The particular relationship between a peculiar habitat, such as the one we have just described, and the technology operating within it, here preponderantly a swidden technology, sets upper limits to territorial, socio-economic, or cultural expansion, and limits to changes in socio-cultural forms. With regard to the habitat dimension of the relationship, we may
[121] say in Harris's words, "Limitations imposed by the manner in which plants and animals convert solar energy into comestible material in combination with the availability of land and water resources, the rate of reproduction of the natural biota, and the total ecological balance, furnish conditions unalterable by individual or collective whim",[3] at least with the given level of technological development possessed by the Yaruro. The Yaruro are in no position to change the total ecological balance, to increase the carrying capacity of the land or water for plant or animal species. For
182 example, under the llanos conditions, the use of slash-and-burn horticulture exhausts arable land at a rate greater than it recovers. The proportion of
241 land held in reserve for future cultivation must be several times greater
311 than that under cultivation at any given moment, the proportion varying with such factors as the rate of fertility recovery, the type of weed and grass invasion, the rate of growth of the secondary forest, the rate of mechanical reconstruction of the soil, and so on. Thus of the total amount of land potentially available in a given expanse of territory, only a part can be horticulturally exploited at any one time. Where the total potentially arable land in a given expanse is itself only a small proportion of the total area, the amount of land available for cultivation at any one moment is, of course, minute. This ecological balance in turn limits the human population

1[1] [See pp. 31-39, category 116 -- Analyst]
1[2] [See pp. 40-41, category 102 -- Analyst]
1[3] [for footnote, see p. 42, category 116 -- Analyst]

and socio-economic forms. Nor can any immediate desire or fancy of the Yaruro change the limitations which the ecological relationship imposes: the carrying capacity of the land for horticultural food plants has, with the given technology, a fairly fixed upper limit. That such limitations exist for their horticulture is recognized by the Yaruro themselves to some extent. First, they recognize that, given the types of soils extant in the habitat, only certain kinds of crops can be used in certain places. Their knowledge in this regard seems to be quite accurate, and, of course, determines where a garden will be prepared at any given time according to projected needs, existing resources, and past exploitations. Again, they know that a swidden lasts three years, a fact not only confirmed by the evidence of conditions in recently abandoned patches but also by the results of soil analyses.[9] After the three years, they say, the swidden must be allowed to fallow for a number of years. They use the word 'five', but the writer believes 'five' is intended to mean 'some' years. The conditions of abandoned gardens, with their rank growth of lush grasses, unmanageable with dibble or machete, and of the places chosen for preparing new gardens, all cut out of relatively large second growth, suggest that the fallow period is at least 10 years, and probably upwards. We shall use 10 years as a basis for calculations below, since after such a time, the shade has driven out the succulent grasses which are replaced by herbaceous plants or woody underbrush. In view of these considerations, it may be said that Yaruro horticultural practices have been well-adapted to the particular soil and water conditions of their habitat on the basis of explicit recognition of these conditions.

Without basic change in their technology, the balance between the Yaruro's present technology and the habitat conditions we have described set real upper limits both on production and on productivity, the latter defined as production per capita per year, and therefore sets limits on the absolute size and the form of the society. Let us suppose optimal population conditions unlike the present continuing depopulation due to western diseases and massacres by Venezuelans were present as an hypothetical ideal state. The tendency of any plant or animal population is to increase until it balances in a stable equilibrium with the available nutritional resources, other factors constant.[10] If the population increases beyond this point, either a portion of the population must seek elsewhere for its food, or a portion must die, or the population will exploit the resources so as temporarily or permanently to reduce them to lower potentials, as in the case of cattle overgrazing pastures. A new land-population equilibrium is then reached at a somewhat lower level. The only other possibility is to innovate new forms of exploitation, a point we return to below.

Under optimal conditions, then, we may estimate maximum Yaruro population within the boundaries of such a territory as presently occupied by the Caño Totúdoro Yaruro of the Central Cinaruco, a territory bounded for all practical purposes by walking-and-working distance from the village. Within this area of about 65 sq. mi. a maximum of about 800 acres, or that 2% of the total area which is wooded, contains all tillable land. However,

9,10 [for footnotes see p. 42-48, category 116 -- Analyst]

311 241 within these 800 acres, much is occupied by the streams, calculated at their flood maxima which define non-gardenable areas, while other parts are inadequate in soils or water for use as gardens. Consequently, the actually tillable areas comprise a maximum of about 200 acres or about 0.5% of the land surface. It should be noted, of course, that all these 200 acres are not usable for crops since those in the *montes* cannot be used for cane and bananas, while the wet areas nearest the streams cannot be used for corn or manioc. Thus the maximum area for the staple crops, manioc, corn, and bananas, is about 145 acres (see Table I).[11]

168 311 Using Carneiro's equations,[12] we may estimate the maximum population which would be in equilibrium with this acreage, estimating .5 acres as an approximate amount of land required to provide the average person with the food he ordinarily derives from cultivated plants per year.[13] The calculation gives us 92 persons (see Figure 1).[14] We may also estimate the number of years (L) the group may stay in the present locality with its present population of 24 before wearing out the available tillable land so that they would have to move (see Figure 2). This would be 50 years. Since the entire fallow and planting cycle of any piece of land is only 13 years, under present circumstances, the Totûdoro Yaruro will not have to move from their present territory at all, in view of their small and decreasing population.

[128]

Figure 1

$$P = \frac{\frac{T}{(R+Y)} \times Y}{A}$$

$$P = \frac{\frac{200}{10+3} \times 3}{.5}$$

P = 92 (=67 if R is 15)

Figure 2

$$L = \frac{\frac{T}{P \times A}}{Y}$$

$$L = \frac{\frac{200}{24 \times .5}}{3}$$

L = 50 years

R = year of fallow
Y = years of productivity
A = land used to provide plant food for one person a year
P = population
L = number of years group located in one place
T = acres of cultivable land within walking-working distance of village

[262] The ideal figures given above would be somewhat modified upwards by the additional foods provided by fishing, hunting, and gathering which, in the wet season, constitute about 30% of the diet and, in the dry, perhaps

[11] [for Table I see pp. 28-30, category 116--Analyst]
[11,12,13,14] [for footnotes, see p. 43, category 116--Analyst]

50% of the diet or a little less. The ideal figures would again be reduced, on the other hand, by allowing for the predations on gardens of animals, especially the pigs, which eat manioc and corn, the Guahibo Indians who allegedly steal sugar cane, and insect losses. Our figures, then, will be modified only a few units by the additional sources of foods. We may thus revise our population figure to between 100 and 105 (or, if a 15-year fallow period is assumed, the figure would be 75-80), figures which correspond to the Yaruro's own ideal of what a proper population for this area should be. If the population increased beyond this number of people, the Yaruro would have to exploit their gardens at a rate greater than the rate of land reconstitution, and also expand hunting, fishing, and gathering beyond the average long-term carrying capacity of the savanas and the rivers, thus reducing their potential productivity. Adding together the maximum populations supportable by these food resources, as well as by the recently introduced pigs, a figure approximating 125-150 persons might be reasonable for this particular territory. This gives a density of 2 persons per sq. mile, a characteristic figure for tropical forest tribes.[15]

If the population rose beyond this maximum capacity of the land-technology relationship, groups would either have to fission off, go on the warpath, regulate population by any of a number of internal institutions such as infanticide, or die either from extreme famines or from steady nutritional deficiency. Under present population conditions none of these is necessary, yet both fissioning and population regulation by contraception occur. Fissioning appears to be fostered by the search for settlement locations requiring minimum labor for maximum return and also to establish community authority under the person leading the fissioning group independent of that excercised by the community from which fissioning took place. Contraception appears to be a matter of choice revolving about maintaining a certain freedom from the cares of motherhood until such time as the marriage partners are reasonably convinced that the marriage is permanent. Indirectly, this contributes to the distribution of more effective female producers among the more effective male producers in the most productive areas, since a second marriage often involves shifting to a generally more effective husband whereas a shift to a less effective husband is scarcely to be found. Both fissioning and contraception, however, give evidence of techniques which were developed to handle man-food balance in happier days.

A number of formal characteristics of any ecology may permit us to deduce the form of society which would be expected on the basis of such characteristics. In so far as the ecological forms were to remain essentially unchanged over great periods of time, no changes in the forms of the social order attached to the ecological conditions would be expected. An internal equilibrium is maintained until such time as a dynamic imbalance occurs because of changes from internal or external sources. It is essential to examine to what extent the internal equilibrium prevents or fosters the occurence of dynamic imbalances in any particular ecological setting. We shall return to this question after the following itemization of Yaruro ecological forms.

[15] [for footnote see p. 43, category 116 -- Analyst]

2:Leeds E-5 (1958)1961 SS19 Yaruro SS19

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[p.28]

TABLE I

Number, Size, and Crop Areas of Gardens of the Totudoro Yaruro: % [1] of Garden Planted to Each Crop and Areas in Acres.

Gardens #	Sq. Ft.	Acres		Manioc % Acres	Corn % Acres	Bananas % Acres	Cane % Acres	Squashes % Acres	Inyame % Acres	Other[2]
OLD: Totally abandoned (4th and 5th years)										
3.	15,000	0.35								
36.	10,000	0.23								
37.	15,000	0.35								
38.	8,000	0.19								
39.	8,000	0.18								
40.	12,000	0.28								
43.	10,000	0.23								
44.	10,000	0.23								
Total	88,000	2.04	2.04							
OLD: 3d and 4th years										
6.	13,500	0.31				sparse[3]				
8.	5,000	0.12				sparse				
11.	8,500	0.20				negligible				
12.	13,000	0.30				sparse				
16.	32,500	0.74				little				
20.	6,500	0.15		sparse						
41.	15,000	0.35				negligible				
42.	15,000	0.35				negligible				
Total	109,000	2.52	4.53							

[p.29]

TABLE I (cont.)

Gardens #	Sq. Ft.	Acres		Maniac %	Maniac Acres	Corn %	Corn Acres	Bananas %	Bananas Acres	Cane %	Cane Acres	Squashes %	Squashes Acres	Inyame %	Inyame Acres	Other[a]
MATURE: 2nd & 3rd years																
1.	60,000	1.40		100	1.40	—	—	—	—	—	—	—	—	—	—	—
4.	3,000	0.07		90	0.06	—	—	—	—	—	—	—	—	10	0.02	—
5.	7,000	0.18		80	0.14	—	—	20	0.04	—	—	—	—	—	—	—
7.	6,000	0.14		—	—	—	—	20	0.03[b]	80	0.11	—	—	—	—	—
9.	50,000	1.16		60	0.70	—	—	10	0.12	25	0.29	—	—	5	0.06	+[a]
10.	1,000	0.02		—	—	—	—	—	—	sparse		—	—	—	—	—
13.	25,000	0.58		40	0.23	—	—	25	0.15	35	0.20	—	—	—	—	—
15.	16,000	0.37		—	—	—	—	30	0.11	70	0.26	—	—	—	—	—
23.	20,000	0.47		25	0.12	—	—	30	0.14	45	0.21	—	—	—	—	—
26.	10,000	0.23		—	—	—	—	20	0.05	80	0.18	—	—	—	—	—
28.	40,000	0.92		50	0.47	—	—	10	0.09	40	0.37	—	—	—	—	—
31.	30,000	0.70		100	0.70	—	—	—	—	—	—	—	—	—	—	—
34.	13,000	0.30		100	0.30	—	—	—	—	—	—	—	—	—	—	—
35a.	10.000	0.22		55	0.13	—	—	30	0.07	10	0.02	5	0.01	—	—	+[c]
Total	291,000	6.76	11.32		4.25				0.80		1.64		0.01		0.08	Acres
NEW: First year																
14.	14,000	0.32		—	—	—	—	—	—	100	0.32	—	—	—	—	—
17.	6,000	0.14		35	0.05	—	—	20	0.03	35	0.05	—	—	10	0.01	—
18.	6,000	0.14		45	0.06	45	0.06	—	—	—	—	—	—	10	0.02	—
19.	6,500	0.15		35	0.05	35	0.05	10	0.02	12	0.03	—	—	5	0.01	—
22.	8,000	0.18		—	—	—	—	35	0.06	65	0.12	—	—	—	—	—
24.	37,500	0.86		45	0.39	—	—	35	0.30	20	0.17	—	—	—	—	—

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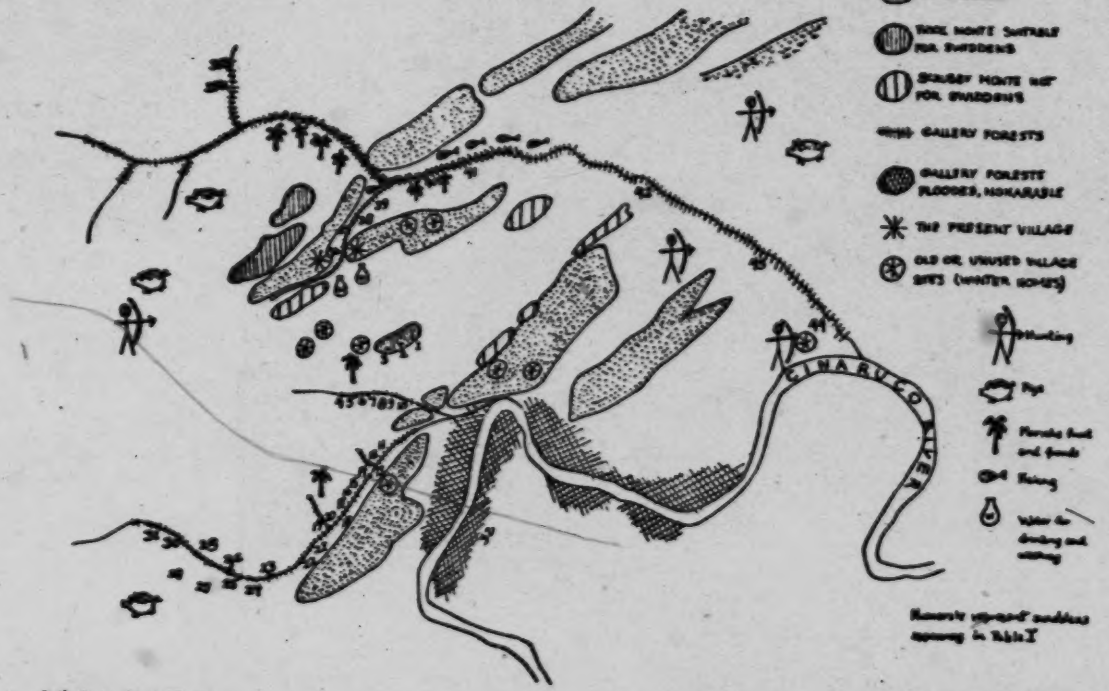
2:Leeds E-5 (1958)1961 SS19 Yaruro SS19

MAP I- Winter Resource Areas



KEY

- SAND DUNES
- SAND MONTS SUITABLE FOR DWELLINGS
- SCRUBBY MONTS NOT FOR DWELLINGS
- GALLERY FORESTS
- GALLERY FORESTS FLOODED, NONARABLE
- THE PRESENT VILLAGE
- OLD OR UNUSED VILLAGE SITES (WINTER HOMES)
- Hunting
- Fish
- Planting land and fruits
- Mining
- Water for drinking and bathing

Resource regions and sites appearing in Table I

1 inch = ca 1.25 mi

Maps by Jo Leeds.

(p.40)

2:Leeds E-5 (1958)1961 SS19 Yaruro SS19

MAP II Summer Resource Areas

KEY

- Hunting
- Pigs
- Gathering
- Fishing
- water for drinking and washing

CINARUCO RIVER

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[illegible]

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TABLE I (cont.)

Gardens #	Sq. Ft.	Acres		Manioc %	Manioc Acres	Corn %	Corn Acres	Bananas %	Bananas Acres	Cane %	Cane Acres	Squashes %	Squashes Acres	Inyame %	Inyame Acres	Other[1]
25.	9,500	0.22		35	0.08	35	0.08	20	0.04	10	0.02	—	—	—	—	—
27.	1,950	0.05		—	—	—	—	—	—	—	—	200[7]	0.10	—	—	—
29.	2,500	0.06		100	0.06	100[8]	0.06	—	—	—	—	—	—	—	—	—
30.	15,000	0.35		80	0.28	80[9]	0.28	20	0.07	—	—	—	—	—	—	—
32.	12,000	0.30		—	—	—	—	—	—	100	0.30	—	—	—	—	—
33.	13,000	0.30		55	0.17	55[10]	0.17	20	0.05	20	0.06	—	—	10[11]	0.03	—
35b.	10,000	0.22		50	0.12	60[12]	0.14	30	0.07	10	0.02	10	0.02	—	—	+[13]
Total	142,950	3.29	14.61		1.26		0.84		0.65		1.09		0.12		0.07	Acres
IN PREPARATION																
2.	15,000	0.35		—	—	—	—	—	—	—	—	—	—	—	—	—
21.	20,000	0.46		—	—	—	—	—	—	—	—	—	—	—	—	—
Total	35,000	0.81	15.42													

1. These percents are highly approximate since crops were often distributed quite irregularly around gardens, often even interplanted. They represent impressionistic guesses.
2. These mostly include yautía ('ocumo'), pineapples.
3. 'Sparse' means that trees are scattered here and there, bearing lightly; 'negligible' refers to a few atrophied bunches in an entire patch; 'little' means a very small production, above sparse.
4. These were very sparse.
5. Pineapples, yautía.
6. Pineapples, pumpkins, yautía.
7. Successively planted to melons and squash in same season.
8. Double cropped in same area.
9. Corn and manioc double cropped in same area.
10. Corn and manioc double cropped in same area.
11. Inyame interplanted among corn and manioc.
12. Double cropped with manioc.
13. Yautía, pineapples, melons, pumpkins.

2:Leeds E-5 (1958)1961 SS19 Yaruro SS19

[p.301

7: Leeds E-4, 5 (1958) 1964 SS19 Yaruro SS19

social features reported, ideological features reported, and relations with other tribes mentioned. The card sets will be arranged by geographical location of the tribe so that for any given time period one may pull out all the sets and arrange the tribes in their spatial order. Thus for any time period a picture of the trait distributions, cultural-ecological conditions, inter-tribal socio-ecological relations, and acculturational-social contacts and events should be obtainable.

V

Though, to date, I have been concerned mainly with collecting bibliography and documentary materials rather than with their analysis, I should like to hazard several very tentative conclusions, or perhaps guesses, with respect to the ethnohistory of the llanos, and particularly of the Yaruro, based on the geographic, ethnographic, archeological, linguistic, and historical data known to me now. Some, however, are presented more as hypotheses for proof or disproof through continued research.

First, Petrullo's description is erroneous at least as respects the subsistence economy. Late Nineteenth Century travellers like Crévaux and Vela and several persons in this century mention horticulture. Still earlier reports go back to the earlier Eighteenth Century when missionaries speak of horticulture. Their reports apply to the Yaruro, Otomaco, Guahibo, and other groups. It has not yet been possible to decide whether they introduced or found horticulture among these peoples. Petrullo's error appears to have several explanations:

A) That he was incapacitated for several weeks by sore feet and was unable to travel about the land away from the rivers. In my experience, a careful criss-crossing of the land on foot is an absolute necessity if one is to know how these peoples carry on their subsistence activities. I have paced off with a pedometer the entire area used by the group I worked with. In the course of so doing I discovered all kinds of gardens, houses, and other evidences of their land use. These would not otherwise have been discovered by an observer nor mentioned by the Yaruro, since mainly what is physically present is, to them, worthy of mention.[10] I should say a great portion of my most important data came from such accidental discoveries made while walking about.

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[10] I would stand at a certain spot in a garden and ask "Whose garden is this?" "Juan's." Then I might walk perhaps ten feet and say, "Juan keeps his garden well." "But this is not Juan's garden." "You just said that this was Juan's garden." "That was over there on the other side of that row of corn." This happened a number of times. I also asked once, "Is there female shamanism here?" "No." Several days later, a group from an neighboring village came to visit. After an all-night session of the *tou'be*, several women performed shamanistic rites. I said, "I thought you said there is no female shamanism here?" "There isn't anyone here [i. e. in our locality] who practices — these women are from upstream." The same cleaving to locus was observed with respect to time. I was told that Miguel was a shaman ("musico"). I said "Miguel, are you not a musico?" "I am not a musico. I cannot sing." A few weeks later, he was singing. I said,

7: Leeds E-4, 5 (1958) 1964 SS19 Yaruro SS19

B) Petrullo restricted his visits to the sand banks along and in the river, and, after his first arrival, most of his travelling was done on the streams. Gardens are never to be found on the sand banks and bars, but rather, usually, on the affluent creeks which are just above flood level of the rivers in the rainy season. Therefore he was not in a position to see the gardens which Le Besnerais later saw in the same area when he explored back from the river.

C) Petrullo was in the llanos in the dry season when the Yaruro move nearer the rivers both to secure a water supply as the water table lowers and to avail themselves of the much more plentiful and accessible river fauna[11] at a time when vegetable harvests are reduced because of drought. He was therefore observing dry-season subsistence — and perhaps only a part of it.

D) The probability that he observed only a part of the dry-season subsistence pattern in his area is reinforced by two considerations:

1) He reports the fact that 150 Yaruro had been massacred by Venezuelans a month before his arrival (p. 181). Their response under such circumstances is, as fast as possible, to get off the land that the Venezuelans want and to move to the rivers. I myself had occasion to observe such a diaspora, occurring in response to a smaller massacre. In view of this sort of response, it is likely, therefore, that Petrullo's group was living off river resources and away from their gardens at the time of his visit.

2) Maps indicate that in the lower part of the Capanaparo River, the flooding is greater and the number and size of side creeks suitable for horticulture is smaller than upstream on any of the large rivers. In other words, the available area for garden plots is much smaller, and riverine subsistence proportionately more important. Upriver, and more especially on the Sinaruco and on the middle and upper Cunaviche and Arauca rivers, there is much more tillable ground.

"I thought you said you could not sing and were not a musico?" "Yes, that was true last week when I had the grippe, but now my grippe is better I can be a musico again." And many similar examples of the extreme caution one needed to exercise regarding negative responses in order to be sure they were not merely descriptive of the place and moment. If Petrullo asked "Do you raise crops?", his informants would most likely have said, "No, we have no crops here", under the circumstances in which he found them.

[11] The river fauna is more plentiful and accessible in dry season because, first, it is more concentrated, and, second, it is more visible. During the wet, flooding season, fish, and other animals spread even into smaller streams and out upon the watery llanos — we caught a small piranha on the grassy, watercovered plain itself. On the plains, the fish are lost among the grasses and are virtually impossible to spear or shoot with bow and arrow. The river turbulence of the rainy season, meanwhile, has brought so much mud from further upstream that many of the rivers are opaque, especially in those parts of the llanos constructed of mud rather than sandy soils. Fish and the water reptiles and mammals are well-cloaked by the murky stream. The waters and the plains clear in the dry season so that the fish are concentrated in the limpid, grassless waters of the rivers, while land animals and riparian fauna are all crowded together near the banks in their search for food and water.